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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,853	11/01/2005	Yasuo Ohama	37904-0058	4615

28481 7590 12/18/2008

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EXAMINER	
SONG, MATTHEW J	
ART UNIT	**PAPER NUMBER**
1792	

MAIL DATE	DELIVERY MODE
12/18/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/555,853	OHAMA, YASUO	
	Examiner	Art Unit	
	MATTHEW J. SONG	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 16-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 16-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 11/24/2008 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 7,299,658 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Withdrawn Rejections

2. Applicant's arguments, see the remarks, filed 11/24/2008, with respect to the rejection(s) of claim(s) 1-14 and 26-28 under 35 U.S.C. 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kemmochi et al (US 2003/0012899). Applicant's statement of a joint venture is persuasive to overcome the rejection in view of Kemmochi et al (US 6,641,663) which only qualified as prior art under 35 U.S.C. 102(e).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 4, 6, 17, and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites, "a second transparent layer made of synthetic quartz glass is formed over only a part of an inner surface of the crucible, said part including at

least an inside region of the crucible that extends from 0.15L to 0.55L. However claim 4 which depends from claim 1 recites " the second transparent layer has a thickness of 0.2 mm or less on the inner surface of the crucible in a range from 0.6-1.0L." It is unclear what "only" is intended to mean because claim 4 allows the second layer to be present on a portion of the crucible outside of the range in claim 1.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-14 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kemmochi et al (US 2003/0012899)in view of Sato et al (US 6,136,092), Ohama (US 2002/0192409 A1) and Nakajima et al (US 5,306,473).

Kemmochi et al teaches a quartz crucible comprising an outer layer formed by melting natural silica powder (pure quartz grain such as natural silica) ([0047] and [0051]); a first transparent layer **18** made of natural quartz formed on the inside thereof (Fig 3, [0035]-[0036]); and a second transparent layer **16** made of synthetic quartz glass formed over the entire inside surface, this clearly suggests 1.0 L (Fig 1; Fig 3; [0035]-[0036]).

Kemmochi et al teaches an outer translucent silica glass layer ([0030]). Kemmochi et al does not teach an opaque outer layer.

In a method of forming a quartz crucible, note entire reference, Sato et al teaches an opaque outer layer and a transparent inner layer (col 3, ln 30-40).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Kemmochi et al by using an opaque outer layer, as taught by Sato et al, because an opaque outer layer has a higher strength than transparent quartz (col 1, ln 40-50).

The combination of Kemmochi et al and Sato et al does not explicitly teach the first transparent layer has a thickness of 0.4-5.0 mm. The combination of Kemmochi et al and Sato et al teaches a side portion has a thickness of 10.0 mm with an inner layer of 0.2-1.0 mm and a bulk layer of 6.5-9.4 mm, thus a first transparent layer having a thickness of 0.4-5.0 mm can be inferred based on a total thickness of 10.0 mm ('899 [0031] and [0038]). Furthermore, Ohama et al teaches a quartz crucible comprising a translucent outer layer of quartz, a transparent inner layer and an intermediate layer ([0013]-[0016]). Ohama et al also teaches the thickness of the intermediate layer of 0.5 mm or more ([0023]).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Kemmochi et al and Sato et al by using an intermediate layer of 0.5 mm or more, as taught by Ohama et al, to provide a crucible with sufficient strength to the crucible ([0019]).

The combination of Kemmochi et al, Sato et al and Ohama et al does not teach the second transparent layer is formed only over a part of an inner surface of the crucible.

In a quartz glass crucible for pulling a single crystal, note entire reference, Nakajima et al teaches an opaque outer layer **17** and a transparent inner layer **15** which only extends over part of the inner surface. (Fig 2 and col 3, ln 1-68). Nakajima et al teaches the disadvantageous effects of the bubbles placed in the crucible body can be eliminated and the yield of a pulling single crystal ca be improved. (col 6, ln 1-10).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Kemmochi et al, Sato et al and Ohama et al by having the transparent inner layer only extend over part of the inner surface, as taught by Nakajima et al, to improve the yield of growing crystals and to eliminate the negative effects of bubbles.

Referring to claim 2 and 22, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches a second transparent layer thickness of 0.2-1.0 mm ('899 [0031]).

Referring to claim 3, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches 1.0 L, as discussed previously.

Referring to claim 4, see the remarks for claims 2-3 above.

Referring to claims 5, 18-20, 25 and 27, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches an opaque silica with an OH group concentration of 80 ppm or less ('092 col 3, ln 55-67) and an inner layer with an OH concentration of 100-400 ppm to a depth of 1 mm, with an inner layer thickness of 0.5 mm ('409 [0023]), which suggests an intermediate layer OH concentration of 100-400 ppm for the intermediate layer. Overlapping ranges are prima facie obvious (MPEP 2144.05). In regards to the relation limitation, the ranges overlap the claimed ranges thus the relationship would have been obvious to one of ordinary skill in the art.

Referring to claims 6 and 15, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches forming an opaque outer layer, a transparent transition layer (first transparent layer) and a transparent inner layer (second transparent layer), wherein the second transparent layer extends over the entire inner surface of the crucible (1.0L), as discussed previously. The combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al also teaches flowing silica powder, melting and vitrifying to form the transparent layer (‘409 [0037] and ‘’899 [).

Referring to claims 7-8 and 10-14, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al does not teach the claimed number of brown rings in relation to the surface level of the melt. First, this limitation is merely an intended use because the limitation does not provide any structural limitation, only a measurement of brown rings after pulling a single crystal, which is a method limitation. The combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al is capable of performing the claimed intended use, thus meets the claimed limitation. Second, the crucible taught by the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al is expected to have the claimed number of brown rings in the relation to the surface level of a silicon melt if performed in the claimed intended use because the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches the same crucible as applicant in terms of crucible material and OH concentration. Therefore, a similar crucible is expected to have similar properties after performing a particular intended use. The same arguments apply to claim 11, which claims a similar intended use limitation of an etching treatment or sandblasting because an etching treatment or sandblasting is an intended use and the crucible is expected to have similar properties after performing the claimed intended use.

Referring to claim 9, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches a mixture of natural and synthetic quartz can be used to form the inner layer (‘409 [0029]).

Referring to claim 16, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches 1.0L, as discussed previously.

Referring to claim 17, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches an inner layer of 0.2-1.0 mm (‘663 col 3, ln 50-67). Overlapping ranges are held to be prima facie obvious (MPEP 2144.05).

Referring to claim 21, 23 and 24, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches an opaque outer layer, a first transparent layer having a thickness within the claimed range and a second transparent layer, as discussed previously. The combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al also teaches the straight portion of the opaque area is 75% or less of the total height (which correlates to a transparent portion of 75% or less), overlapping ranges are prima facie obvious (MPEP 2144.05). (‘473 Abstract).

Referring to claims 26 and 28, see the remarks regarding claims 1. Also, the combination of Kemmochi et al, Sato et al, Ohama et al and Nakajima et al teaches an inner transparent layer **15** extends only up a portion of the crucible **17**. ('473 Fig 2). The portion extends 75% or less of the crucible height (‘473 Abstract), which suggests 0.55 L because overlapping ranges are prima facie obvious (MPEP 2144.05). And the upper portion would have a thickness of 0 mm which is within the claimed range of 0.2 mm or less.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. SONG whose telephone number is (571)272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on 571-272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew J Song
Examiner
Art Unit 1792

MJS
December 15, 2008

/Robert M Kunemund/
Primary Examiner, Art Unit 1792